

REMARKS

In the Office Action dated September 16, 2009, the Examiner rejects claims 12-20 under 35 U.S.C. §112, first paragraph and rejects claims 1, 3, 5, 6, 8, 10 and 11 under 35 U.S.C. § 102(b) as being anticipated by Munshi. The Examiner makes the following rejections under 35 U.S.C. § 103(a):

- Claim 7 as being unpatentable over Munshi in view of Hwang et al.;
- Claim 9 as being unpatentable over Munshi in view of Usui et al.;
- Claims 1, 3, 5, 8, 10 and 11 as being unpatentable over Fukuzawa in view of Hinton;
- Claim 6 as being unpatentable over Fukuzawa and Hinton and in further view of Munshi;
- Claim 7 as being unpatentable over Fukuzawa and Hinton and in further view of Hwang; and
- Claim 9 as being unpatentable over Fukuzawa and Hinton and in further view of Usui.

With this Amendment, claims 1, 6, 10, 12, 13 and 16 are amended. Claims 5, 14, 15, 17 and 21 are canceled. Claims 2 and 4 were canceled in a previous response. Claims 22-25 are new. After entry of this Amendment, claims 1, 3 and 6-13, 16, 18-20 and 22-25 are pending in the Application. Reconsideration of the Application as amended is respectfully requested.

Rejections under 35 U.S.C. §112

The Examiner rejects claims 12-20 under 35 U.S.C. §112, first paragraph, contending that a liquid electrolyte is not supported in the specification. The specification states in the first sentence of paragraph [0044] that the electrolyte layer can be a liquid, a gel and/or a solid phase. However, to further prosecution, "liquid" has been removed from the independent claims. Applicants respectfully submit that the rejection is overcome.

Rejections under 35 U.S.C. §102(b)

Claims 1, 3, 5, 6, 8, 10 and 11 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Munshi. Independent claims 1 and 10 (and by their dependency claims 3, 6, 8, 11, 22 and 23) as amended recite a bipolar electrode stack comprising a collector, a cathode electrically connected to a first side of the collector, an anode electrically connected to a second side of the collector, and one or more layers of electrolyte overlaying the cathode and anode. The collector comprises a high-polymer material containing a plurality of electrically conductive particles, wherein the cathode and anode directly contact at least a portion of a surface of the high-polymer material of the collector, and wherein the plurality of electrically conductive particles comprises a first and second type of electrically conductive particles, wherein the first type contacts the cathode and the second type contacts the anode. Support for this is found in the specification in paragraphs [0029] and [0030].

The Examiner contends that Munshi teaches or suggests each and every element of Applicants' claims 1 and 10. However, Munshi does not teach a collector comprised of a high-polymer material containing a plurality of electrically conductive particles, wherein the plurality of electrically conductive particles comprises a first and second type of electrically conductive particles, wherein the first type contacts the cathode and the second type contacts the anode. Accordingly, Munshi does not anticipate claims 1 and 10 and those that depend therefrom. Applicants respectfully submit that the claims are allowable over Munshi.

New claims 22 and 23 depend indirectly from claims 1 and 10 respectively and further recite that the high-polymer material of the collector is one of polyethylene terephthalate, polyimide and polyamide. The Examiner states that one would appreciate that PET is the acronym for polyethylene terephthalate. (Office Action, p. 3). This may be true if only the acronym were used. However, Munshi, throughout the specification, is clearly using the acronym PET to refer to polyester, as denoted by Munshi's use of "PET(polyester)." (See col. 9, line 30; col. 19, line 7; col. 22, ll. 4-5; and claim 11). Therefore, Munshi was defining

in its specification that it was referring to polyester when it used PET. Accordingly, in addition to their dependency from allowable claims, claims 22 and 23 are allowable for this reason.

Independent claims 12 and 25 (and claims 13, 16, 18-20, 24 and 26 due to their dependency) recite as amended a method of manufacture and a battery comprising a collector consisting essentially of an electrically conductive polymer. Munshi discloses a collector comprised of polymer either impregnated with some kind of conductive particle or layered with a conductive material. One example of the conductive particles is, for example, a metal salt. (Col. 8, ll. 23-34). The polymer has a hetero atom for the metal ions of the metal salt to attach. (Col. 8, ll. 62-64). The current collectors are either a metallic element or a metalized plastic. (Col. 9, ll. 42-44). In the first exemplary battery described in Munshi, the collector is an aluminum coated polymer. The aluminum layer ranges in thickness as shown in Table 1 of Example 4. Examples 1-3 do not discuss a collector. In Example 5 of Munshi, a double-metalized substrate is disclosed comprising a polymer substrate 12 and metallization layers 16a and 16b in Fig. 1C. Another alternative is to laminate anode and cathode active elements on opposite sides of a double-metalized substrate as described, with the substrate further impregnated with electronically conductive material, as shown in Fig. 3. (Col. 26, ll. 5-15). The thickness of the metallization layer on the polymer layer of the substrate is selected according to the desired conductivity of the layer. (Col. 27, ll. 52-55). Example 6 uses a metal foil collector. (Col. 28, line 3). Therefore, Munshi does not disclose a collector consisting essentially of an electrically conductive polymer. In addition, if the Examiner interprets the metal foil layers in Munshi as being separate from the collector, Applicants claimed battery clearly does not include a metal foil or layer under that interpretation as the anode and cathode directly contact the polymer of the collector.

Because Munshi fails to teach a collector consisting essentially of the electrically conductive polymer that directly contacts both the cathode and anode as recited in claims 12 and 25, Munshi does not teach, suggest or anticipate claims 12 and 25, as well as

claims 13, 16, 18-20, 24 and 26 by their dependency. Applicants respectfully submit that the claims are allowable over Munshi.

Regarding claim 6 and new claim 25, the Examiner states that Munshi discloses some of the polymers listed in these claims. (Office Action, p. 3). However, these polymers are used with a metalized substrate as described at, for example, col. 21, line 66; col. 22, line 21, 28-31, 52-53 (metallization *of the impregnated substrate* is optional); and col. 26, lines 7-9 (double-metallized substrate). Therefore, the invention of each of claims 6 and 25 is not anticipated by Munshi.

Rejections under 35 U.S.C. §103(a)

The Examiner rejects claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Munshi as applied to claims 1-6, 8, 10 and 11 and further in view of Hwang et al. Claim 7 depends from claim 1 to include all of the limitations therein. As described above, Munshi fails to teach or suggest each and every limitation of claim 1. Therefore, the combination of Munshi and Hwang et al. would need to cure the deficiencies of Munshi. Hwang et al. fails to teach or suggest the same elements Munshi fails to teach or suggest -- a collector comprising the high-polymer material containing a plurality of electrically conductive particles, wherein the plurality of electrically conductive particles comprises a first and second type of electrically conductive particles, wherein the first type contacts the cathode and the second type contacts the anode, as recited in claim 1. Therefore, Hwang et al. does not cure the deficiencies of Munshi. At least by its dependency from claim 1, the invention of claim 7 is not rendered obvious by the cited combination.

The Examiner rejects claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Munshi in view of Usui et al. Claim 9 depends from claim 1 to include all of the limitations therein. As described above, Munshi fails to teach or suggest each and every limitation of claim 1. Therefore, the combination of Munshi and Usui would need to cure the

deficiencies of Munshi. Usui et al. fails to teach or suggest the same elements Munshi fails to teach or suggest -- a collector comprising the high-polymer material containing a plurality of electrically conductive particles, wherein the plurality of electrically conductive particles comprises a first and second type of electrically conductive particles, wherein the first type contacts the cathode and the second type contacts the anode, as recited in claim 1. Therefore, Usui et al. does not cure the deficiencies of Munshi. At least by its dependency from claim 1, the invention of claim 9 is not rendered obvious by the cited combination.

The Examiner rejects claims 1, 3, 5, 8, 10 and 11 as being unpatentable over Fukuzawa in view of Hinton. As the Examiner states, Fukuzawa does not teach a collector that includes a high-polymer material. (Office Action, p. 6). Fukuzawa also fails to teach or suggest a plurality of electrically conductive particles comprising a first and second type of electrically conductive particles, wherein the first type contacts the cathode and the second type contacts the anode.

Hinton does not teach or suggest any type of collector at all. Hinton is only concerned with a separator plate between electrochemical cells. Hinton discloses that the separator plate can be a polymer with electronically conductive material.

The combination of Fukuzawa and Hinton does not teach or suggest to one skilled in the art a collector of a high polymer material containing a plurality of electrically conductive particles comprising a first and second type of electrically conductive particles, wherein the first type contacts the cathode and the second type contacts the anode, in combination with the other features of these claims. Therefore claims 1, 3, 5, 8, 10 and 11 are allowable over the cited combination.

The Examiner rejects claim 6 as being unpatentable over Fukuzawa and Hinton and in further view of Munshi. Claim 6 depends from claim 1 to include all of the limitations therein. As explained above, each of Munshi, Fukuzawa and Hinton fails to teach or suggest each and every limitation of claim 1. For this reason, their combination fails to teach or

suggest those same elements -- a collector comprising the high-polymer material containing a plurality of electrically conductive particles, wherein the plurality of electrically conductive particles comprises a first and second type of electrically conductive particles, wherein the first type contacts the cathode and the second type contacts the anode, as recited in claim 1. At least by its dependency from claim 1, the invention of claim 6 is not rendered obvious by the cited combination.

The Examiner rejects claim 7 as being unpatentable over Fukuzawa and Hinton and in further view of Hwang. Claim 7 depends from claim 1 to include all of the limitations therein. As explained above, the combination of Fukuzawa and Hinton fails to teach or suggest each and every limitation of claim 1. Therefore, the addition to the combination of Hwang et al. would need to cure those deficiencies. Hwang et al. fails to teach or suggest the same missing elements -- a collector comprising the high-polymer material containing a plurality of electrically conductive particles, wherein the plurality of electrically conductive particles comprises a first and second type of electrically conductive particles, wherein the first type contacts the cathode and the second type contacts the anode, as recited in claim 1. Therefore, Hwang et al. does not cure the deficiencies of Fukuzawa and Hinton. At least by its dependency from claim 1, the invention of claim 7 is not rendered obvious by the cited combination.

The Examiner rejects claim 9 as being unpatentable over Fukuzawa and Hinton and in further view of Usui. Claim 9 depends from claim 1 to include all of the limitations therein. As described above, the combination of Fukuzawa and Hinton fails to teach or suggest each and every limitation of claim 1. The addition to the combination of Usui et al. would need to cure those deficiencies. However, Usui et al. fails to teach or suggest the same missing elements -- a collector comprising the high-polymer material containing a plurality of electrically conductive particles, wherein the plurality of electrically conductive particles comprises a first and second type of electrically conductive particles, wherein the first type

contacts the cathode and the second type contacts the anode, as recited in claim 1. Since Usui et al. does not cure the deficiencies of Fukuzawa and Hinton, the combination cannot render the invention of claim 1 obvious. At least by its dependency from claim 1, the invention of claim 9 is not rendered obvious by the cited combination.

Conclusion

Applicants respectfully submit that this Amendment has antecedent basis in the Application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the Application. Reconsideration of the Application as amended is requested. It is respectfully submitted that this Amendment places the Application in suitable condition for allowance; notice of which is requested.

If the Examiner feels that prosecution of the present Application can be expedited by way of an Examiner's amendment, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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